



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/608,549 | 06/30/2000 | Gurumukh S. Tiwana | CISCP151 | 2362 |

22434 7590 03/04/2004

BEYER WEAVER & THOMAS LLP
P.O. BOX 778
BERKELEY, CA 94704-0778

EXAMINER

DUONG, THOMAS

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2143

DATE MAILED: 03/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

2

Office Action Summary

Application No.

09/608,549

Applicant(s)

TIWANA ET AL.

Examiner

Thomas Duong

Art Unit

2143

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on December 23, 2003 (Paper No. 4). The amendment filed on December 23, 2003 has been entered and made of record. The original application contained *claims 1-25*. In the pre-amendment filed on December 23, 2003, the applicant canceled *claims 9*, added *claims 26-41* and amended *claims 1, 3-8, 10-11, 15, 18, 20-21, 24-25*. There are *no claims* allowed. Hence, *claims 1-8 and 10-41* are presented for further consideration and examination.

Response to Argument

2. The Applicant's arguments and amendments filed on December 23, 2003 have been fully considered, but they are not deemed fully persuasive. The Examiner finds that the Applicants' arguments are deemed moot in view of the following new grounds of rejection as explained here below, necessitated by applicant's amendments to the claims which significantly affected the scope thereof.
3. With regard to *claims 1, 18, 25 and 41*, the Applicants points out that:
 - *Claim 1 is directed towards a "method for assigning traffic buckets to a cache system." Claim also requires that "a) when a new cache system starts up in a cache cluster having a plurality of total buckets, determining*

a full bucket allocation for the new cache system; b) periodically determining a load of the new cache system; c) when it is determined that the new cache system is underloaded, slowly assigning a portion of the full bucket allocation or a portion of previously shed buckets to the new cache system unless the full bucket allocation has already been assigned to the new cache system; and d) when it is determined that the new cache system is overloaded, shedding a portion of the buckets previously assigned to the new cache system." In embodiments of the invention, buckets are slowly assigned to a new cache and buckets are shed when the new cache becomes overloaded, which allows the new cache to likely not become overloaded with a new load assignment. Independent claims 18, 25, and 41 have a similar limitation regarding slow assignment and shedding of buckets to a new cache.

However, the Examiner finds that the Applicants' arguments are deemed moot in view of the following new grounds of rejection as explained here below, necessitated by applicant's amendments to the claims which significantly affected the scope thereof.

Li (US005634125) reference discloses,

- *a) when a new cache system starts up in a cache cluster having a plurality of total buckets, determining a full bucket allocation for the new cache system; (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44,*

lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)

- *b) periodically determining a load of the new cache system;* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)
- *c) when it is determined that the new cache system is underloaded,* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)
- *d) when it is determined that the new cache system is overerloaded,* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)

However, Li (US005634125) does not teach,

- *slowly assigning a portion of the full bucket allocation or a portion of previously shed buckets to the new cache system unless the full bucket allocation has already been assigned to the new cache system; and*
- *shedding a portion of the buckets previously assigned to the new cache system.*

Dreszer (US006442661B1) teaches,

- *slowly assigning a portion of the full bucket allocation or a portion of previously shed buckets to the new cache system unless the full bucket*

allocation has already been assigned to the new cache system; and

(Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)

- *shedding a portion of the buckets previously assigned to the new cache system.* (Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Dreszer reference with Li reference to provide rapid memory allocation and de-allocation, reduced memory fragmentation, maximizes the amount of memory available for a cache (e.g., file system I/O buffers) while optimizing the amount of memory available for other uses, and manages competition for different memory uses by system self-adaptation to different usage levels across different network environments and over time within one network environment, including self-tuning to optimize performance to a variety of environments and dynamic conditions.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8 and 10-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US005634125) and further in view of Dreszer (US006442661B1).
6. With regard to claims 1, 18, 25 and 41, Li reference discloses,
 - *a) when a new cache system starts up in a cache cluster having a plurality of total buckets, determining a full bucket allocation for the new cache system;* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)
 - *b) periodically determining a load of the new cache system;* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)
 - *c) when it is determined that the new cache system is underloaded,* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)
 - *d) when it is determined that the new cache system is overerloaded,* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)

However, Li reference does not teach,

- *slowly assigning a portion of the full bucket allocation or a portion of previously shed buckets to the new cache system unless the full bucket allocation has already been assigned to the new cache system; and*
- *shedding a portion of the buckets previously assigned to the new cache system.*

Dreszer teaches,

- *slowly assigning a portion of the full bucket allocation or a portion of previously shed buckets to the new cache system unless the full bucket allocation has already been assigned to the new cache system; and*
(Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)
- *shedding a portion of the buckets previously assigned to the new cache system.* (Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine Dreszer reference with Li reference to provide rapid memory allocation and de-allocation, reduced memory fragmentation, maximizes the amount of memory available for a cache (e.g., file system I/O buffers) while optimizing the amount of memory available for other uses, and manages competition for different memory uses

by system self-adaptation to different usage levels across different network environments and over time within one network environment, including self-tuning to optimize performance to a variety of environments and dynamic conditions.

7. With regard to claims 2, 7-8, 10, 12-14, 19, 24, 26, 31-33 and 35-37, Li and Dreszer references disclose the invention substantially as claimed,

See *claims 1, 18 and 25* rejection as detailed above.

Furthermore, Li reference discloses,

- *assigning the full bucket allocation to the new cache system when the cache cluster is operating at a maximum load* (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)

8. With regard to claims 3, 20 and 27, Li and Dreszer references disclose the invention substantially as claimed,

See *claims 1, 18 and 25* rejection as detailed above.

Furthermore, Dreszer reference discloses,

- *wherein slowing assigning a portion of the full bucket allocation to the new cache comprises:*
- *initials assigning a portion of the full bucket allocation to the new cache system; when no buckets have been previously shed, assigning a portion of the unassigned buckets to the new cache system; and when buckets have been previously shed, assigning a portion of a number of buckets*

Art Unit: 2143

that were previously shed from the new cache system. (Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)

9. With regard to claims 4-6, 11, 21-22, 28-30 and 34, Li and Dreszer references disclose the invention substantially as claimed,

See *claims 1, 18 and 25* rejection as detailed above.

Furthermore, Dreszer reference discloses,

- *wherein shedding a portion of tree buckets previously assigned to the new cache comprises:*
- *when no buckets have been previously shed, periodically shedding a portion of the assigned buckets from the new cache system; when buckets have been previously shed, periodically shedding a portion of a number of buckets that were previously shed from the new cache system; (Dreszer, abstract; col.2, line 65 – col.3, line 16; col.3, lines 49-60; col.4, line 49 – col.5, line 8; col.5, lines 42-65; col.5, line 66 – col.6, line 8; col.6, lines 9-31; col.6, line 55 – col.7, line 15; col.8, lines 14-25; fig.10-12)*

10. With regard to claims 15-17, 23 and 38-40, Li and Dreszer references disclose the invention substantially as claimed,

See *claims 4, 21 and 28* rejection as detailed above.

Furthermore, Li reference discloses,

- *wherein shedding a portion of tree buckets previously assigned to the new cache comprises:*
- *receiving load information from the new cache, the load information indicating whether the new cache system is overloaded; and using the load information to determine whether the new cache is overloaded. (Li, abstract; col.1, lines 18-37, lines 38-54; col.2, lines 29-44, lines 48-61; col.6, lines 18-51; col.6, line 52 - col.7, line 53; col.9, lines 4-21; fig.6A; fig.9)*

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Smith (US005581736A)
- Chen et al. (US005819083A)
- Li (US005687369)

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory

period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Duong whose telephone number is 703/305-1886. The examiner can normally be reached on M-F 7:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A Wiley can be reached on 703/308-5221. The fax phone numbers for the organization where this application or proceeding is assigned are 703/872-9306 for regular communications and 703/872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703/305-3900.

Thomas Duong (AU2143)

February 27, 2004


DAVID WILEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100